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Workman Nydegger
1000 Eagle Gate Tower
60 East South Temple
Salt Lake City, UT 84111

EXAMINER
PATEL, NIRAV G

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>29 April 2010</u>.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>27-34,36-39 and 41-45</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>27-34,36-39 and 41-45</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____.

        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

It would be of great assistance to the Office if all incoming papers pertaining to a

filed application carried the following items:

1.   Application number (checked for accuracy, including series code and
      serial no.).
2.   Group art unit number (copied from most recent Office communication).
3.   Filing date.
4.   Name of the examiner who prepared the most recent Office action.
5.   Title of invention.
6.   Confirmation number (See MPEP § 503).

Response to Arguments

1.   Applicant's arguments with respect to claims 29 and 44 have been considered

but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed
publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in
public use or on sale in this country, more than one year prior to the date of application for patent in
the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by
another filed in the United States before the invention by the applicant for patent or (2) a patent
granted on an application for patent by another filed in the United States before the invention by the
applicant for patent, except that an international application filed under the treaty defined in section
351(a) shall have the effects for purposes of this subsection of an application filed in the United States
only if the international application designated the United States and was published under Article 21(2)
of such treaty in the English language.

3.   Claims 32 through 34 and 36 through 37 are rejected under 35 U.S.C. 102(b) as
being anticipated by Dobashi et al. (U.S. Pub. No.: 2001/0031072, "Dobashi").

   1) Regarding Claim 32, Dobashi teaches a method for facial image acquisition,
comprising the steps of:

   providing a plurality of active infrared lights to illuminate a target face (Figure 35: An
illumination section (342) is used to illuminate a user's face, as the user (100) approaches the apparatus),
wherein said active infrared light mounted around a lens of an image capturing unit is a
near infrared (NIR) light in an invisible spectrum (Paragraph 248: Unit 342 is an infrared
illumination lamp, which is mounted around (the location in relationship to the camera) the lens (above),
in the invisible light spectrum);

   providing an image capturing unit for capturing NIR images of said target face
(Figure 35: The camera (341) captures a plurality of facial images of a target face (person, 100), which is
illuminated by the NIR light (342), and sends it to 104 (Figure 1, an image processing section)), and

   sending / storing said NIR face images to a data processing unit used for
localizing and recognizing said target face (Figure 1: Feature value extraction section (106)
detects the positions of eyes and nose from the facial region detected).

   2) Regarding Claim 33, Dobashi teaches in addition to the method of claim 32,
wherein a NIR filter is disposed on said image capturing unit for cutting off visible light
radiation while allowing the NIR light radiation to pass through, so as to improve NIR
face image acquisition (Paragraphs 248-249: The infrared camera is a camera having sensitivity only
in an infrared wavelength region (near-infrared, within the 700 nm to 1000 nm), which is in the rage of
infrared. Due to its sensitivity only to infrared wavelength, it filters all other wavelengths including cutting
off visible light).

3) Regarding Claim 34, Dobashi teaches in addition to an facial image acquisition apparatus used for realizing the method of claim 32, comprising an active infrared light and an image capturing unit (Figure 35: Unit 342 is an active infrared light (NIR) and 341 is an image capture unit), wherein said image capturing unit includes a lens (Paragraph 323: The lens (311) of the camera (301) allows for acquiring images); and

said active infrared light used for illuminating a target face comprises a plurality of active NIR lights mounted around said lens (Paragraph 248: Unit 342 is an infrared illumination lamp, which is mounted around (the location in relationship to the camera) the lens (above), in the invisible light spectrum); and

said image capturing unit sends at least one facial image to a data processing unit (Paragraph 247: Figure 35 is a facial image recognition apparatus, which acquires images of a face and uses an image processing section (data processing unit) to recognize faces from images which are acquired by the camera).

4) Regarding Claim 36, Dobashi teaches in addition to the apparatus of claim 34, wherein the direction of said active NIR lights is parallel to an axis of said lens (Figure 35: The rays from the NIR light source (342) are parallel to an axis of the lens).

5) Regarding Claim 37, Dobashi teaches in addition to the apparatus of claim 34, wherein said image capturing unit includes an NIR optical filter of band-wavelength-pass or long-wavelength-pass type, and it is used to suppress visible lights while allowing NIR lights to pass through so as to achieve better NIR imaging effect (Paragraphs 248-249: The infrared camera is a camera having sensitivity only in an infrared wavelength region (near-infrared, within the 700 nm to 1000 nm), which is in the rage of infrared. Due to its sensitivity only to infrared wavelength, it filters all other wavelengths including cutting off visible light).

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 27, 28, 39, 41, 42, 44 and 45 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Dobashi in view of Waehner et al. (U.S. Pat. No.: 7,136,513,

"Waehner").

      1) Regarding Claim 27, Dobashi teaches a method of face recognition,

comprising the steps of: providing an active infrared light to illuminate a target face

when a user approaches an image capturing unit (Figure 35: An illumination section (342) is

used to illuminate a user's face, as the user (100) approaches the apparatus),

      wherein the active infrared light mounted around a lens of said image capturing

unit is a near infrared (NIR) light in an invisible light spectrum (Paragraph 248: Unit 342 is an

infrared illumination lamp, which is mounted around (the location in relationship to the camera) the lens

(above), in the invisible light spectrum);

      capturing a plurality of facial images from a target face illuminated by said active

NIR light, and sending a NIR facial image to a data processing unit (Figure 35: The camera

(341) captures a plurality of facial images of a target face (person, 100), which is illuminated by the NIR

light (342), and sends it to 304 (an image processing section));

localizing said face and / or eyes of said face (Figure 1: Feature value extraction section

(106) detects the positions of eyes and nose from the facial region detected), and cropping a portion

of said facial image from said NIR facial image by said data processing unit (Paragraph

96: Feature value generation section 106c cuts out the facial region at certain size and shape based on

the positions of the facial parts detected to generate a feature value);

extracting facial feature from said portion of said facial image (Figure 1: Feature

value extraction section (106) detects the positions of eyes and nose from the facial region detected);

comparing facial feature with that of previously extracted and stored in a facial

image database (Paragraph 102: The recognition section (107) collates (compares) recognition data

stored in the registration information preservation section (database, 108) with the values obtained in the

extraction section); and

outputting a recognition result obtained from said comparing step (Paragraph 112:

The identification results outputs the results of the recognition comparison (Figure 7)).

Waehner teaches wherein said active NIR light comprises a plurality of flash NIR

light sources, or a combination of a plurality of flash NIR light sources and a plurality of

constant NIR light sources (Figure 8: Light source 40 is composed of LEDS (plurality) to illuminate

the subject (person), which are infrared (Col. 5, Lines 36-53) and strobed (flashed, Col. 5, Lines 21-35).

The examiner in interpreting infrared to read on NIR light as the claim defines NIR light in an invisible light

spectrum, as recited above, and as infrared light in the invisible portion of the light spectrum, it reads on

the claims).

Hence the prior art includes each element claimed, although not necessarily in a

single prior art reference, with the only difference between the claimed invention and the

prior art being the lack of actual combination of the elements in a single prior art reference.

In combination, Dobashi's teachings perform the same as they do separately of capturing images of a face, localizing, extracting and comparing features of the face and then determining recognition as a result of the comparison. Waehner's teachings perform the same as they do separately of using a strobed IR light source to illuminate a face to acquire images.

Therefore one of ordinary skill in the art, such as an individual with a basic degree in electrical engineering, could have combined the elements as claimed by known methods, and that in combination, each element merely performs the same function as it does separately.

The results of the combination would have been predictable, due to the fact that using a flash of IR light allows for taking IR images at select intervals, which can be used with frame subtraction to identify the areas of increased brightness due to the use of the IR light compared to the frames which are not illuminated using IR, and resulted in modifying the invention of Dobashi to include pulsing of IR light sources, as taught by Waehner, while acquiring images of the face.

Therefore, the claimed subject matter would have been obvious to a person having ordinary skill in the art at the time the invention was made.

2) Regarding Claim 28, the combination of Dobashi and Waehner teaches the limitations of claim 27, where Dobashi further teaches wherein a NIR filter is disposed on said image capturing unit for cutting off visible light radiation while allowing the NIR

light radiation to pass through, so as to improve NIR face image acquisition (Paragraphs
248-249: The infrared camera is a camera having sensitivity only in an infrared wavelength region (near-
infrared, within the 700 nm to 1000 nm), which is in the rage of infrared. Due to its sensitivity only to
infrared wavelength, it filters all other wavelengths including cutting off visible light).

    3) Regarding Claim 39, the combination of Dobashi and Waehner teaches the
method of claim 27, where Dobashi further teaches an facial image recognition
apparatus used for realizing the method of claim 27, comprising an active infrared light
and an image capturing unit (Figure 35: Unit 342 is an active infrared light (NIR) and 341 is an
image capture unit), and a data processing unit (Figure 35: The camera (341) captures a plurality of
facial images of a target face (person, 100), which is illuminated by the NIR light (342), and sends it to
304 (an image processing section));

    wherein said image capturing unit includes a lens (Paragraph 323: The lens (311) of
the camera (301) allows for acquiring images); and

    said active infrared light comprises a plurality of active NIR lights used for
illuminating a target face and mounted around said lens (Paragraph 248: Unit 342 is an
infrared illumination lamp, which is mounted around (the location in relationship to the camera) the lens
(above), in the invisible light spectrum);

    said image capturing unit is used for capturing facial images and sending at least
one facial image to said data processing unit (Paragraph 247: Figure 35 is a facial image
recognition apparatus, which acquires images of a face and uses an image processing section (data
processing unit) to recognize faces from images which are acquired by the camera);

    said data processing unit comprises a PC or an embedded processor in which
image processing software is installed, used for receiving images from said image

capturing unit and localizing eyes and face in said facial images (Paragraphs 93-95: The feature extraction section 106 is explained, where 106b detects positions of eyes and a nose from part of the facial region detected (thus localizing the eyes and face)), and extracting facial features in said localized facial area (Figure 1: The feature value extract section (106) extracts features from the facial image), and comparing the extracted features with that of previously stored in a facial image database (Figure 1: Unit 108 is the registration information preservation section (database) which is used to compare (in section 107) the data from section 106, which extracts the features (Paragraph 142)).

    4) Regarding Claim 41, the combination of Dobashi and Waehner teaches the limitations of claim 39, where Dobashi further teaches wherein the direction of said active NIR light is parallel to axis of said lens (Figure 35: The rays from the NIR light source (342) are parallel to an axis of the lens).

    5) Regarding Claim 42, the combination of Dobashi and Waehner teaches the limitations of claim 39, where Dobashi further teaches wherein said image capturing unit includes an NIR optical filter of band-wavelength-pass or long-wavelength-pass type, and it is used to suppress visible lights while allowing NIR lights to pass through so as to achieve better NIR imaging effect (Paragraphs 248-249: The infrared camera is a camera having sensitivity only in an infrared wavelength region (near-infrared, within the 700 nm to 1000 nm), which is in the rage of infrared. Due to its sensitivity only to infrared wavelength, it filters all other wavelengths including cutting off visible light).

    6) Regarding Claim 44, the combination of Dobashi and Waehner teaches the limitations of claim 39, where Dobashi further teaches wherein there is a displaying device for displaying facial images, used for adjusting the position of the target face in

vertical and horizontal directions (Paragraphs 133-134: A display device (110) is used to adjust the position of the target face, which is done so using a speaker to provide voice guidance);

said displaying device is a mirror, mounted in such a way that its surface normal is co-axis to said lens (Figure 11: Unit 110 is a display section used to display the image acquired by the capturing unit, which is mounted opposite of the camera (coaxial to the lens). Examiner's note: the display section is being interpreted to read on a mirror using the definition of "mirror" provided by the Random House Dictionary, which defines a mirror as "something that gives a minutely faithful representation, image, or idea of something else." Thus the display which displays the image acquired by the capturing unit gives a minutely faithful image of something else (the person being imaged). The dictionary definition is being used as the neither the claims nor the specification explicitly define the mirror in the claim).

7) Regarding Claim 45, the combination of Dobashi and Waehner teaches the limitations of claim 39, where Dobashi further teaches wherein said active NIR light can be controlled by a power switch, a proximity sensor switch or an RFID controlled switch (Paragraph 87: The infrared sensor detects the approach (proximity of a human being which is a switch to turn on the illumination source).

6.   Claims 29 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dobashi in view of Waehner and in further view of Vertegaal et al. (U.S. Pub. No.: 2005/0175218, "Vertegaal").

1) Regarding Claim 29, while the combination of Dobashi and Waehner teaches the limitations of claim 27, they fail to teach the limitations of claim 29.

However, in the same field of endeavor, Vertegaal teaches detecting specular highlight reflections in eyes in said NIR face image to localize eye positions and thereby localize said face (Claim 1: Eye tracking is achieved by producing glints or reflections in the subject's eyes and then analyzing the image to find the glint and center of the eye and then determining the position of the eye (eye gaze)).

Determining the location of the eyes using specular highlights (reflections) allow for a way of efficiently determining eye location and point of gaze which can improve identification of facial features, which Dobashi uses, thus allowing for accurate results.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teachings of Vertegaal to Dobashi and Waehner.

2) Regarding Claim 43, while the combination of Dobashi and Waehner teaches the limitations of claim 39, they fail to teach the limitations of claim 43.

However, in the same field of endeavor, Vertegaal teaches wherein said data processing unit includes a means for detecting specular highlight reflection in each eyes in said NIR face image, it is used for localizing said eyes and face through localizing the positions of a highlight spots (Claim 1: Eye tracking is achieved by producing glints or reflections in the subject's eyes and then analyzing the image to find the glint (highlight spots) and center of the eye and then determining the position of the eye (eye gaze)).

Determining the location of the eyes using specular highlights (reflections) allow for a way of efficiently determining eye location and point of gaze which can improve identification of facial features, which Dobashi uses, thus allowing for accurate results.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teachings of Vertegaal to Dobashi and Waehner.

7.   Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dobashi

in view of Waehner and in further view of Hay et al. (U.S. Pat. No.: 6,419,638, "Hay").

        1) Regarding Claim 30, while the combination of Dobashi and Waehner teaches

the limitations of claim 27, they fail to teach the limitations of claim 30

        However, in the same field, Hay teaches judging whether eyes and/or face is

successfully localized after sending at least one facial image to a data processing unit; if

yes, going forward to the next step of cropping a portion of said facial image, otherwise

repeating the localizing step until eyes and/or face is successfully localized (Figure 1: The

raw image file (22) is input (into a data processing unit) and is processed to find (localize) eye (39) and

then when they are, the image is cropped, if not, the step is repeated (decision 42) until the eyes are

located).

        Ensuring that the eyes are located in acquired image and then continuing

processing ensures that there is sufficient data to provide recognition of a user, as if

features, such as the eyes, are not present, proceeding with the process would not

result in identification, thus wasting time and system resources. Applying Hay's

teachings would allow for the system to be efficient, by avoiding the problems

discussed.

        Therefore it would have been obvious to one of ordinary skill in the art at the time

of the invention to apply the teachings of Hay to Dobashi and Waehner.

8.   Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dobashi

in view of Waehner and in further view of Lee et al. (U.S. Pub. No.: 2003/0058111,

"Lee").

       1) Regarding Claim 31, while the combination of Dobashi and Lee teaches the

limitations of claim 27, they fail to teach the limitations of claim 31.

       However, in the same field of endeavor, Lee teaches wherein said image

capturing unit can track the movement of target face illuminated by said active NIR light

(Abstract: A person of interest in a scene (area illuminated by active light, within the field of an image

capturing unit) can track a person of interest).

       Having an option to track an individual illuminated by active NIR light allows for

Dobashi a way to track the identified user who is given pass, so that it can be ensured

that the user only proceeds to where they are authorized, allowing for more secure

access.

       Therefore it would have been obvious to one of ordinary skill in the art at the time

of the invention to apply the teachings of Lee to Dobashi and Waehner.

9.   Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dobashi

in view of Kansakoski et al. (U.S. Pub. No.: 2003/0047135, "Kansakoski").

       1) Regarding Claim 38, while Dobashi teaches the limitations of claim 37, he

fails to teach the limitations of claim 38.

       However, in the same field of endeavor, Kansakoski teaches wherein said NIR

optical filter is an NIR optical coating or an NIR optical glass disposed on the surface or

inside of said lens (Claim 23: The apparatus has disc-like chopper which has NIR filters (coating)

which allows IR radiation to pass).

Allowing for the NIR light to pass to the camera by using Kansakoski's teachings

with Dobashi's allows for filtering out other wavelengths of light which interfere with the

acquiring device resulting in a degraded image, which gives rise to less accurate

determination of individuals being processed.

Therefore it would have been obvious to one of ordinary skill in the art at the time

of the invention to apply the teachings of Kansakoski to Dobashi.

Conclusion

10.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nirav G. Patel whose telephone number is (571)270-5812. The examiner can normally be reached on Monday - Friday 8 am - 5 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nirav G. Patel/
Examiner, Art Unit 2624

/CHARLES KIM/
Primary Examiner, Art Unit 2624